Abstract

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Title of diploma thesis: Whole blood – New Blood Component Containing Platelets

Background: The aim of this thesis was to evaluate in vitro quality parameters and haemostatic function of leucodepleted WB and their comparison with non-leucodepleted WB. The same way the quality parameters (RBC, PLT, HB and hemolysis) of erythrocyte blood component were measured and compared in day D14, D21, D35 and D42.

Methods: WB collected from 30 healthy group A donors was divided into two groups – leucodepleted (LWB), using in-line platelet-sparing filters and collected to a blood bag system IMUFLEX® WB-SP (Terumo BCT, USA) and non-leucodepleted WB (NLWB), colletected to a blood bag system CompoFlex® Single System (Fresenius Kabi, Germany). Both groups were stored at 4±2°C for 14 days and following parameters were measured in days D0, D1, D3, D5, D10 and D14: WBC, RBC, PLT, HB, hemolysis, pH, TEG, FVIII, TT, PT, aPTT, aggregometry, concentration of PF4 and sCD40L (ELISA). Moreover, in days D0, D7 and D14 was measured the level of expression of platelet activation marker CD62P (P-selectin), CD42b, CD61 by flow cytometry.

Results: No significant differences between groups LWB and NLWB were found in following parameters: PT, aPTT, Fbg, FVIII, hemolysis and HB. PLTs are at LWB significantly lower at D0 to compare with NLWB. Coagulation index (CI) of TEG, is significantly different only in day D14, where is lower at LWB to compare with NLWB. That correlates with different increasing concentration sCD40L in D14. Marker CD62P shows the biggest differences in its expression between LWB and NLWB. Parameters of erythrocyte blood components don't show any significant differences.

Conclusions: The in vitro quality parameters and hemostatic function of leucodepleted WB with platelet-sparing filter to compare with non-leucodepleted WB are comparable and meet quality and clinical requirements. Both groups show identical or similar changes in storage time. The parameters of erythrocyte blood components are comparable.

Keywords: transfusion; blood components; whole blood; leukodepletion; platelets